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PART 4/4

COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT

Accompanying the document

Proposal for a Council Regulation

on establishing the European High Performance Computing Joint Undertaking

{COM(2018) 8 final} - {SWD(2018) 5 final}

Annex 2 (Part 2)

6.6 Duration of a European HPC Initiative

Regarding the time-frame in which the future EU-initiative should run, a clear majority of respondents confirmed the need for an initiative that goes well into the next multi-annual financial framework (MFF), see Figure 7:

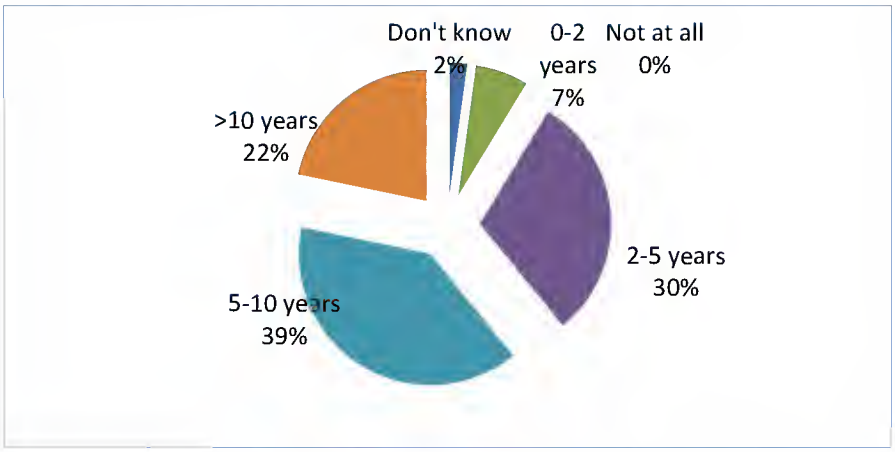


Figure 7 – Time-frame a future EU initiative on HPC should run

When looking at the different groups of respondents, a clear majority of each group confirmed the need for an initiative that expands beyond the last three years of Horizon 2020, as can be seen in Figure 8:

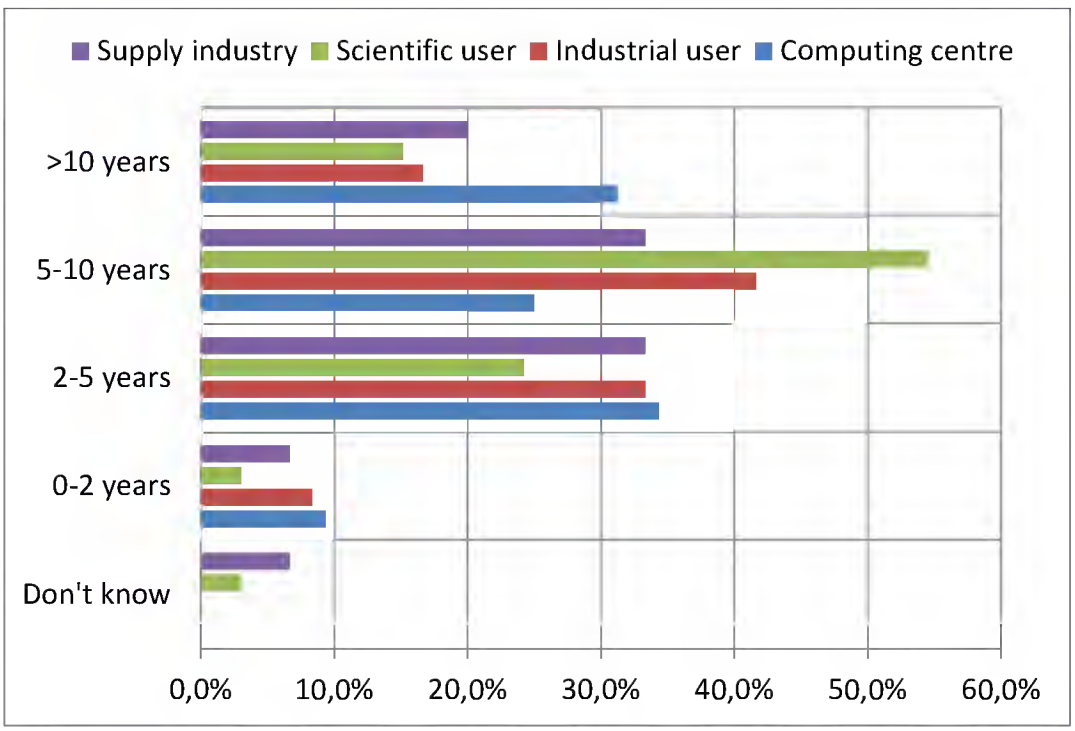


Figure 8 – Time-frame a future EU initiative on HPC should run

6.7 Improvements expected from a future EU initiative on HPC

Regarding improvements expected from a future EU initiative on HPC vis-à-vis the current situation, three main points emerged from the responses, indistinctly for all groups of respondents:

- First, an expectance of more EU-based technology with specific support to the EU hardware industry leading to the development of critical technologies within Europe.
- Second, the reduction of fragmentation, a better coordination of European HPC resources through the consolidation of the current programs into a single, clear and well-funded program aimed at building an exascale class system based on EU-developed technology.
- Third, the increase of competitiveness of European industry through a better involvement of SMEs in HPC.

6.8 Options to reach the objectives of a future EU initiative on HPC

Regarding the role of existing EU-funded HPC actions, such as PRACE, ETP4HPC and GEANT, in the future EU initiative on HPC, it was confirmed by respondents that existing actions:

- should be improved, especially PRACE[1], and
- collaborate closer, so that in a bigger picture provided by EuroHPC the existing actions should complement each other.[2]

As shown in Figure 9, the majority (>50%) of respondents proposed that participation in the new EU initiative on HPC should be constituted by *academia & research* (90.2%), *industry* (88.8%), *supercomputing centres* (87%), and *HPC intermediaries*, e.g. Centres of Excellence (57.6%).

[1] E.g. by strengthening its scientific oversight, by collaborating closer with industry, if possible.

[2] Examples:

"All these instruments have been developed under conditions that are no longer relevant."

"None of them existed before the advent of Big Data and now they are just adapting old structures to new problems. These instruments are in need for renovation and they must find a way to merge their efforts for the benefit of European science and not of the local HPC centres."

"It is very important that PRACE, GEANT and ETP4HPC with their own well-defined goals work together for achieving a sustainable EU HPC eco-system across Europe. As an example, PRACE supports users, however it needs to work very closely with GEANT to foresee how the future demands of users can be serviced through GEANT activities. Similarly through PRACE's input, ETP4HPC can better understand and define the future requirements of EU HPC users."

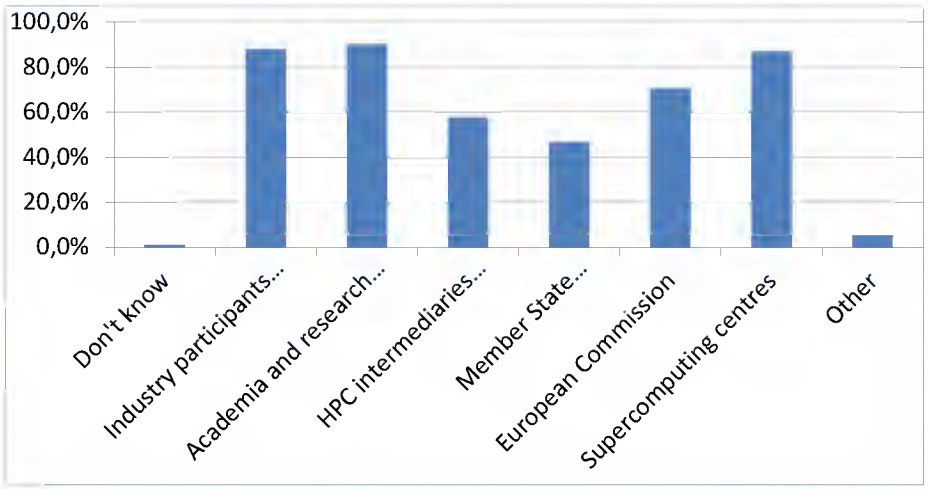


Figure 9 – Who should be part of a potential EU initiative on HPC?

Among those who declared to know how responsibilities in relation to the use of the exascale machines in the context of the new EU initiative on HPC should be distributed (59.8%) a recurrent idea was that HPC machines should be owned, be operated, and maintained by a consortium including, but not limited to, supercomputing centres, EU public infrastructures, and PRACE Tier-0 centres.

With respect to the usage and access conditions of the HPC machines, the allocation of computing time, and the decision criteria to allocate computing time, respondents' open-ended suggestions were less coherent and many scattered ideas were mentioned, such as the European Commission with the help of calls, a peer review process favouring the clear prioritization of usage, steering committees representing the owners of the machines, existing supercomputing centres, and management boards of public/private partnerships.

Figure 10 shows the breakdown relative to each group. As can be seen, the responses are rather uniform across the different groups of respondents.

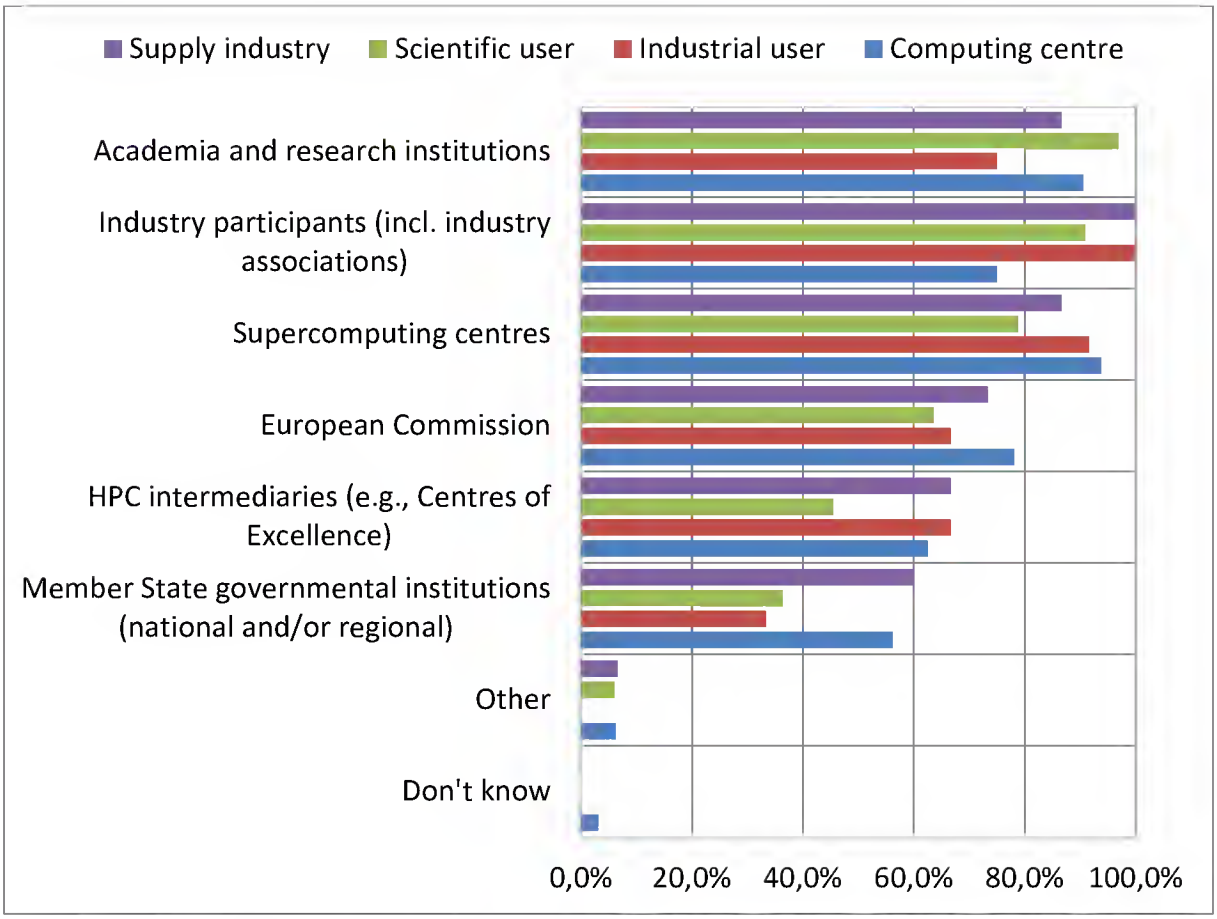


Figure 10 – Who should be part of a potential EU initiative on HPC?

Without surprise, each group identified itself as a key participant in the new potential EU initiative on HPC, indicating self-engagement and a strong will of each group to contribute to the initiative. Within each group the percentage of self-commitment was as follows: Technology supply industry (100%), industrial users (100%), scientific users (97%), and computing centres (93.8%).

Most interestingly, Figure 10 shows a strong consensus among the different groups of respondents that the key actors in a future European HPC Initiative should be the research organisations, industry, and the supercomputing centres. By importance, the next actor identified by all groups of respondents was the European Commission. In particular, for each group of respondents the European Commission should have priority over HPC intermediaries and over Member States in a potential EU initiative on HPC.

6.9 Expected impacts of a future EU initiative on HPC

The main desirable impact of such an initiative was expected to be on science and technology development (ranking 4.68/5). Expectations from the participants included:

- Underpinning the development of most emerging technologies and applications, from precision medicine and agriculture to deep learning,
- Development of new materials as well as medicine and healthcare, and
- Reduced economic losses thanks to better weather forecast or traffic forecast.

The second desirable impact (ranking 4.36/5) was expected to be on economy and growth, including competitiveness of Europe's industry. Expectations included:

- Development of more EU-based enterprises and support to digitisation of traditional EU industries,
- Job creation as HPC engineers are and will be needed,
- Development of sharper and more competitive products relying on massive optimisation.

Regarding impacts specific for the respondent's institution, responses included:

- Early access to state of the art HPC technologies stimulating more students in undertaking challenging projects with industry,
- Increased opportunities for R&D collaborations with SMEs, and
- Strengthening the own market position by using HPC as early as possible in the pre-development of products, making use of virtual prototypes and at the same time reducing costly experiments, and reducing waste.

The main desirable impact of such an initiative on a scale of importance between 1 and 5 (with 1=lowest importance and 5=highest) is reported on Figure 11 for each group of respondents.

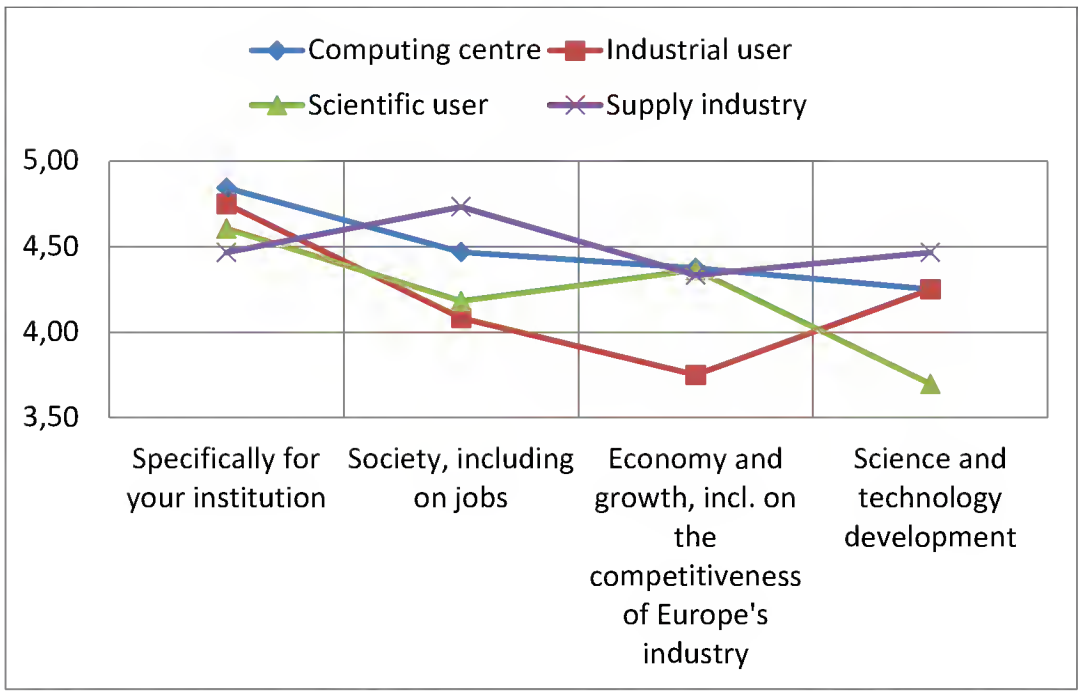


Figure 11 –What would be the desirable impacts from the future EU initiative on HPC?

Except for the technology supply industry group which expects the highest impact on society including on jobs (rating 4.73), all other groups expect the highest impact (rating > 4.5) specifically for their institutions.

1. Summary of the Responses to the Inception Impact Assessment Publication

The Inception Impact Assessment was published on the Commission's Better Regulation Website[3] and a feedback period was given from 3 August 2017 to 05 September 2017. Fifteen

[3] http://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-3896569_en

responses were received[14] (10 from Germany, 3 from UK, 1 from Spain, 1 from Netherlands) with the following main messages:

- four responses agreed to a new EU-wide initiative, and three of them explicitly favoured a Joint Undertaking as the most appropriate instrument;
- eight responses criticised the initiative as allegedly being promoted by the weapons manufacturing industry and sponsored by them;
- one response promoted the own consulting type of company as to be best place to play an active role in the future initiative;
- two responses criticised the initiative as creating either too much waste or as diverting money from help to developing countries.

However, all responses which discussed the issue in technical terms supported the new initiative. Three of them explicitly supported a Joint Undertaking as the best instrument.